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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,304	11/19/2001	Anselm Sickinger	01-1699	7357

20306 7590 06/10/2004

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EXAMINER

GORDON, BRIAN R

ART UNIT PAPER NUMBER

1743

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
09/992,304	SICKINGER ET AL.	
Examiner	Art Unit	
Brian R. Gordon	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7-9-02
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to **a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract appears to be too long and contains claim language such as "comprises".

3. The disclosure is objected to because of the following informalities: The claims should be interpreted light of the specification not vice versa. Therefore the specification should not make reference to the claims as on page 4.

Appropriate correction is required.

Claim Objections

4. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

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dependent form, or rewrite the claim(s) in independent form. Claim 1 is directed to a computer and claim 2 attempts to further limit the computer by incorporating it into a system. This does not further limit the computer of claim 1. If applicant intends to define or claim a system of components, it should be done so by listing the components of the system. Claim 2 merely defines a system by the computer of claim 1, as such the computer of claim 1 has not been further structurally limited for it is known to be an electronic component.

5. Claim 1 is objected to because of the following informalities: It appears that the term "valve" should be value.

Appropriate correction is required.

Claim Interpretations

6. Claims 10 and 11 recite the term "disposable". The term is not structurally limiting for the user can choose to dispose of any element of the device and choose to refer to it as disposable.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 21-30 and 34-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21-30 and 34-35 appear to be directed to a method, however the claim 21 only defines the apparatus as in claim 1 and fails to recite any positive steps of how the structure is used to perform a specified process.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claim 1-7, 21-28, and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Mogensen US 2003/0149505.

Mogensen teaches a method and apparatus for forming a flexible circuit of predetermined design, and in particular to the making of a functioning flexible circuit by depositing multiple layers of a variety of materials in fluid or component form in a set configuration onto a substrate. A source for each of the materials is provided. In one embodiment, the materials are applied to the substrate through accurate positioning and moving of the dispensing heads in three dimensions and through accurate control of the amount of material applied.

In one embodiment the invention includes a computer, dispensers, a dispensing controller, a curing unit, and a base with position control.

Dispensing system 120 holds any number of dispensing heads 105 which contain components or fluids that will be dispensed onto a flexible substrate on the base 150. Dispensing system 120 monitors (tracks) and controls key parameters of the fluid in the dispensing heads so that the fluids are properly prepared and maintained in readiness for the dispensing controller 130. Dispensing system 120 monitors and controls variables including, but not limited to, viscosity and temperature of the fluids in the dispensing heads 105.

In one embodiment, dispenser 105A is a syringe-type dispenser having a nozzle output, and dispensing controller 130 includes a pressure actuator and a pressure sensor coupled with dispenser 105A. Computer 110 receives pressure data from the pressure sensor and controls fluid output by driving the pressure actuator based on the pressure data and on the requirements for fluid output per the circuit specification at each given point on the substrate 99. In other embodiments (see, e.g., FIG. 5), a camera 550 or other optical sensor (i.e., any suitable sensor of electromagnetic spectrum energy) is used to detect the amount of fluid 199 that is dispensed, and thus to provide feedback to computer 110 which in turn adjusts the output flow to achieve the desired amount and position of dispensed fluid 199.

In order to control the flexible-circuit-forming process, the managing computer 110 provides instructions (program) as to the appropriate sequence for depositing then curing the deposited materials.

FIG. 8d is a section view illustrating an embodiment of a dispenser nozzle 808 having an ink-jet fluid outlet. Nozzle 808 includes a reservoir 827 which holds fluid 199.

Otherwise similar to nozzle 805, nozzle 807 of the embodiment shown includes one or more ink-jet tips 818 (micro ejection pumps) which can be individually actuated to dispense a fluid droplet of a controlled size, which is then propelled using pressure or electrostatic force to jump to the substrate 99.

11. Claims 1-2 and 4-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Pelc et al. US 6,203,759.

Pelc et al. disclose an automated (inherency of computer controlled) liquid handling system. The system reservoir is connected with tubing to a pressure control system for controlling the liquid system pressure in the system reservoir. The system reservoir is coupled to one or more microdispensers through a distribution tube having a branched section for each microdispenser. In this embodiment, each microdispenser is coupled to its own flow sensor and to enable a system controller to respectively measure and control the flow of liquid in the each microdispenser.

The system of the invention possesses unique capabilities in microvolume liquid handling. Surprisingly, it has been discovered that sub-nanoliter droplets of liquid can be dispensed with real time verification. Dispensing of a single sub-nanoliter drop can be detected in real time. As the result of dispensing the liquid in sub-nanoliter droplets, the dispensed volume can be precisely controlled. The dispenser of the present invention can automatically detect the liquid surface of the transfer liquid, automatically aspirate, analyze desired volume of the transfer liquid, dispense the transfer liquid without contacting the destination vessel or its contents, and automatically wash off the transfer liquid from dispensing system after each transfer. This system is capable of

automatically sensing liquid surfaces, aspirating liquid to be transferred, and then dispensing small quantities of liquid with high accuracy, speed and precision. The system of the present invention is pulsated at high frequency to prevent or eliminate clogging. Immiscible liquids between the transfer liquid and the system liquid reduces the required amount of transfer liquid needed for dispensing.

A first preferred embodiment by providing a microvolume liquid handling system which includes a positive displacement pump operated by a stepper motor, a piezoresistive pressure sensor, and an electrically controlled microdispenser that utilizes a **piezoelectric** transducer bonded to a glass capillary. The microdispenser is capable of rapidly and accurately dispensing sub-nanoliter ("nl") sized droplets by forcibly ejecting the droplets from a small nozzle, this is known as 'drop-on-demand'. Specifically, the dispenser of the present invention disperses drops in the range from about 5 picoliters to about 500 picoliters, preferably from about 100 picoliters to about 500 picoliters.

Digitally encoded commands (program) cause the stepper motor 28 within the positive displacement **pump** 12 to aspirate discrete volumes of liquid into the microdispenser 16, wash the microdispenser 16 between liquid transfers, and to control the pressure in the system liquid 20 line for microvolume liquid handling system 10 operation. The positive displacement pump 12 is also used to prime the system 10 with system liquid 20 and to dispense higher volumes of liquid through the microdispenser 16. The positive displacement pump 12 includes a valve 38 for connecting a system liquid reservoir 40 to the syringe 30.

The control logic 42 (computer) instructs microdispenser electronics 51 to send a specific number of electrical pulses, e.g., 1000, to the microdispenser 16. The resulting drop in pressure sensor 14 signal is used by control logic 42 to determine the volume of transfer liquid 24 that was dispensed. This dispensed volume determination is verified by the control logic 42 tracking the volume displaced by the movement of the plunger 34 to restore the system liquid 20 line pressure to the pre-dispense value.

Conclusion

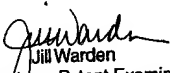
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Flaherty, J. Christopher; Jasperson, Keith E. et al.; Junk, Kenneth W. et al.; Jungmann, Ronald D. et al.; Shajii, Ali et al. ; Martens, Edward M. et al.; Blomquist, Michael L.; Jungmann, Ronald D. et al.; Mimura, Tomonori et al.; Bissett, Brian D.; Peck, Bill J. et al.; Frederick, Erik D. et al.; Lemmo, Tony et al. ; Woodward, Roger P.; Tisone, Thomas C. et al.; Marouiss, Samuel A. et al.; Rhett, Norman K. et al.; Parce, J. Wallace; Wolk, Jeffrey A. et al.; LaBudde, Edward V. et al.; Cork, William H et al.; and Dorenkott, Jeffrey S. et al. disclose computer controlled dispensing systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

brg


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